

App. No. 10/065,992
Amendment dated October 5, 2005
Reply to Office action of July 5, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claim 1 (canceled)

Claim 2 (currently amended): The surface-coated machining tool set forth in claim [[1]] 4, wherein said predetermined thickness of said compound thin film is 0.05 μm or more and 3 μm or less.

Claim 3 (canceled)

Claim 4 (currently amended): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide and cobalt,
with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less;
and

coated to a given thickness in at least a single layer over said cemented-
carbide base material, a compound thin film made up of a combination of, in given
elemental proportions, one or more elements selected from the group titanium,
chromium, vanadium, silicon and aluminum, and one or more elements selected
from carbon and nitrogen; wherein
said compound thin film is vapor-deposited onto said base material
under reaction-gas pressure, base-material bias voltage, and deposition-
temperature conditions that, together with said given thickness and said given
elemental proportions, are predetermined so as to impart a compressive

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residual stress of 0.1 GPa or more and 8 GPa or less to said compound thin film, and

~~The surface-coated machining tool set forth in claim 1, wherein~~
said compound thin film is $[[\ln]]$ surface roughness adjusted to be 0.01 μm or more and 0.5 μm or less by indication Ra.

Claim 5 (previously presented): A surface-coated machining tool, comprising:

a cemented-carbide base material containing tungsten carbide and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and

a hard carbon thin film made up essentially of carbon atoms only, coated to a given thickness over said cemented-carbide base material in at least a single layer, by a physical vapor deposition method in which graphite is made a raw material, and under reaction-gas pressure, base-material bias voltage, and deposition-temperature conditions that, together with said given thickness, are predetermined so as to impart a compressive residual stress of 0.1 GPa or more and 8 GPa or less to said compound thin film.

Claim 6 (original): The surface-coated machining tool set forth in claim 5, wherein said hard carbon thin film is 0.05 μm or more, and 3 μm or less in thickness.

Claim 7 (canceled)

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Claim 8 (previously presented): The surface-coated machining tool set forth in claim 5, wherein said hard carbon thin film is in surface roughness adjusted to be 0.01 μm or more and 0.5 μm or less by Indication Ra.

Claim 9 (canceled)

Claim 10 (original): The surface-coated machining tool set forth in claim 2, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 11 (canceled):

Claim 12 (original): The surface-coated machining tool set forth in claim 4, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 13 (original): The surface-coated machining tool set forth in claim 5, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 14 (original): The surface-coated machining tool set forth in claim 6, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 15 (canceled)

Claim 16 (original): The surface-coated machining tool set forth in claim 8, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

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Claim 17 (currently amended): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide and cobalt,
with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less;
and

coated to a given thickness in at least a single layer over said cemented-carbide base material, by a cathodic-arc deposition method, a compound thin film made up of a combination of, in given elemental proportions, one or more elements selected from the group titanium, chromium, vanadium, silicon and aluminum, and one or more elements selected from carbon and nitrogen; wherein

reaction-gas pressure, base-material bias voltage, and deposition-temperature conditions in said cathodic-arc deposition method, together with said given thickness and said given elemental proportions, are predetermined so as to impart a compressive residual stress of 0.1 GPa or more and 8 GPa or less to said compound thin film; and

said compound thin film is surface roughness adjusted to be 0.01 μm or more and 0.5 μm or less by indication Ra.

Claim 18 (currently amended): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide and cobalt,
with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less;
and

coated in at least a single layer over said cemented-carbide base material, by a cathodic-arc deposition method, a compound thin film 0.05 μm or more and 3 μm

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or less in thickness, made up of a combination of, in given elemental proportions, one or more elements selected from the group titanium, chromium, vanadium, silicon and aluminum, and one or more elements selected from carbon and nitrogen; wherein

reaction-gas pressure, base-material bias voltage, and deposition-temperature conditions in said cathodic-arc deposition method, together with said thickness and said given elemental proportions, are predetermined so as to impart a compressive residual stress of 0.1 GPa or more and 8 GPa or less to said compound thin film; and

said compound thin film is surface roughness adjusted to be 0.01 μm or more and 0.5 μm or less by indication Ra.

Claim 19 (previously presented): A surface-coated machining tool, comprising:

a cemented-carbide base material containing tungsten carbide 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size, and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and

a hard carbon thin film made up essentially of carbon atoms only, coated to 0.05 μm or more, and 3 μm or less in thickness over said cemented-carbide base material in at least a single layer, by a physical vapor deposition method in which graphite is made a raw material, and under reaction-gas pressure, base-material bias voltage, and deposition-temperature conditions that, together with said

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thickness, are predetermined so as to impart a compressive residual stress of 0.1 GPa or more and 8 GPa or less to said compound thin film.

Claim 20 (previously presented): A surface-coated machining tool, comprising:

a cemented carbide base material containing tungsten carbide 0.1 μm or more and 1.5 μm or less in pre-sintering crystal grain size, and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and

a hard carbon thin film made up essentially of carbon atoms only, coated to a given thickness over said cemented-carbide base material in at least a single layer, by a cathodic-arc deposition method in which graphite is made a raw material, and under reaction-gas pressure, base-material bias voltage, and deposition-temperature conditions that, together with said given thickness, are predetermined so as to impart a compressive residual stress of 0.1 GPa or more and 8 GPa or less is imparted to said hard carbon thin film.